

ART. II.—*The Malay Archipelago: the Land of the Orang-Utan and the Bird of Paradise.* A Narrative of Travel, with Studies of Man and Nature. By Alfred Russel Wallace. Macmillan & Co. 1869.

MR. WALLACE'S book has been already noticed in our pages, but it is sufficiently replete with new information and suggestion to justify a more extended review, and we propose in the present paper to treat it less as a book of travels than as a store-house of facts and opinions. The Archipelago has been described, in whole or in part, by many travellers; and the principal islands have formed the subject of valuable historical treatises, such as those of Crawford, Marsden, and Raffles; but Mr. Wallace has by preference taken up those aspects of his subject which his predecessors have ignored, and it is not too much to say that we have in these volumes the first opportunity of forming an opinion on the natural history, in its broad sense, of the great group of Eastern islands,—including in the term 'natural history' not so much the specific peculiarities of animals and plants as the general aspect of the fauna and flora, its geographical distribution, and the numerous questions of what may be called historical geography, which that distribution suggests and solves. Nor should it be regarded as a drawback to Mr. Wallace's work, that he interprets his facts for the most part with reference to a special theory, which has undoubtedly not as yet been accepted by the scientific world as embodying absolute truth. Mr. Wallace is no blind follower of Darwin; and although on many points they are singularly in accord, it should be remembered that Mr. Darwin's great preliminary book, in which he sketched out for the first time his views on the origin of species, was published during Mr. Wallace's absence in the East, and that the development of the opinions of the latter, during the journeys which gave rise to the book before us, was strictly independent of Mr. Darwin. Left often for weeks together to the solitude of his own reflections, without a companion, and disabled as he frequently was by illness from active exertions in the prosecution of his special object, that of collecting birds and insects, he naturally betook himself to philosophic reflection on the phenomena which he had observed; the result was that he arrived by independent research at a set of conclusions for the

most part identical with those of his friend and fellow-thinker at home. This fact could, we believe, be established by reference to the papers which Mr. Wallace sent home at various times during his residence in the Archipelago, and that the world has heard nothing of a quarrel for precedence is due partly to the cordial friendship which unites the two explorers, but more to their common participation in the true scientific spirit, the genuine love of truth, which can hardly exist with jealousy or self-seeking. The simple truth is that Darwinism, right or wrong, is a necessary product of the time we live in ; with our present amount of knowledge, and our present freedom of speculation, it was unavoidable that attempts should be made to solve the complicated problems of nature in some such way. If there had been no Darwin, Mr. Wallace, and perhaps others, would have occupied the vacant place ; and the rapid welcome of the new doctrine by the most philosophical naturalists of the day, old as well as young, sufficiently proves how prepared men's minds were to receive it. Mr. Wallace's book is not an argumentative treatise ; he does not profess to supply us with new arguments in favor of Darwinism ; he only shows, as it were incidentally, that it can be successfully applied to new sets of facts, which indeed is its true test. He assumes some of its main conclusions throughout his book ; but these are the very conclusions which have been almost universally adopted by scientific men, and apart from which, we may safely venture to assert, no philosophical natural history is at all possible. Moreover, he has borne in mind that his book is intended for popular reading, and has nowhere yielded to the temptation of injudicious speculation on the two points on which alone a Darwinian naturalist incurs the danger of annoying the sensibilities of his readers, namely, the relation of the doctrine of development to the belief in a Creative Power, and the relation of man to the anthropoid apes. The latter subject is one which he had ample opportunities to discuss, living as he did among the highest apes and some of the lowest of men, and he deserves at all events the credit of reticence.

We shall first give a general sketch of the conclusions to which Mr. Wallace has been led from his study of the physical geography of the islands and their inhabitants as to the changes which have taken place in the relative distribution of land and water ; and in doing this we shall dwell most upon such of his conclusions as best illustrate his method ; and we shall afterwards pass in review the most interesting of his facts regarding

the natural history of the Archipelago, concluding with an account of the races of men which inhabit it.

The southern boundary of the Archipelago is formed by a well-marked chain or line of islands—Sumatra, Java, Bali, Lombok, Sumbawa, Flores, the small islands between Flores and Timor, and Timor itself, which, however, has its major axis inclined with reference to the continuous line formed by the major axes of the other islands. They are separated by narrow straits, and tied as it were into a single group by a line of volcanoes which runs along their whole length from Sumatra to Timor. The study of the map produces an almost indelible impression on the mind that this series of islands is of common origin, was upheaved at the same time and by the same causes, and was, perhaps, at one period a long bank or isthmus of continuous land, which in later ages was here and there broken by the force of currents. But Mr. Wallace holds that the western portion of the series belongs to Asia, and the eastern to Australia, the division between the two being the fifteen miles of strait which separates the islands of Bali and Lombok, and that there never was a time when this watery barrier did not exist, separating by a sharp line two of the main divisions of the world. To this seemingly arbitrary conclusion he is guided by the marked difference in animal forms which characterises the two halves of the chain. The fauna of Java, to which that of Bali closely approximates, is essentially Asiatic. Its larger quadrupeds—the elephant, the rhinoceros, the tiger and leopard, the wild cattle—all belong to Southern Asia. Its birds are of continental types; many of the species and nearly all the genera are actually common to Java and Continental Asia. In Lombok, on the contrary, there is a new set of species, betraying to the most casual observer a distinct type. Instead of orioles, barbets, fruit-thrushes, and woodpeckers, we have the conspicuous white cockatoos, the *Meliphagidæ* or honey-suckers, and the *Megapodidæ* or brush-turkeys, all well-known Australian types; the large quadrupeds have disappeared, and except the bats or flying quadrupeds, we find only a few straggling species which belong to No-man's-land, and might have been introduced from island to island on ships or on floating wood; while still further east, we discover distinct traces of Australian influence in the existence of Marsupialia, or pouched quadrupeds, a group which has not a single representative on the continent of Asia, or the great islands of Java, Sumatra and Borneo. Nor is this the only contrast between the eastern and western portions of the

chain; the grassy plains of Timor, dotted with straggling Eucalypti and acacias, are not less like the Australian sheepwalks than they are unlike the dense tropical forests of Java and Sumatra, clothing the plains and extending to the summits of the highest mountains. The inhabitants of Timor are tall, nearly black, with frizzled hair, and the long Papuan nose; those of Java belong to the short, brown, straight-haired, flat-faced, small-nosed Malayan race, which is in its essential characteristics identical with the Chinese and Siamese of Eastern Asia. The broad inference from these facts is that Timor and the islands westward from it, as far as Lombock, belong to Australia, and that Bali, Java, and Sumatra belong to Asia.

But there is a distinction of value between the two assertions of our last sentence. Timor does not belong to Australia in the same sense in which Java belongs to Asia; the Australian savage, though approaching the Papuan type to which the Timorese belong, has marked distinctions, both mental and outward; and if we analyse the animal productions, we find that, in Timor for instance, though the general aspect of animal life is undoubtedly Australian, the species are for the most part distinct; the mammalia are altogether so, and in birds, many characteristic Australian groups are wanting to Timor. The birds of Timor contain, as we shall afterwards see, an Australian and a Javanese element; there are as many birds absolutely identical with Javanese as with Australian species; but there are far more birds closely resembling Australian species than birds closely resembling Javanese species. From this we infer that the connection of Timor with Australia has never been, like that of Java with the eastern peninsula of India, a connection of continuity; the countries have always been separated by a sea wide enough to prevent the mammalia and many groups of birds from crossing, but narrow enough to allow the passage of occasional stragglers, which, being isolated from their kind, develop into new though allied species.

A conception unfamiliar to many of our readers perhaps requires further illustration. When the different species of animals were regarded as distinct efforts of the divine Creative Power, it was generally conceived, in accordance with Hebrew tradition, that all were created in some central spot from which they spread to the various regions of the world. As knowledge advanced, this explanation refused to fit the facts; the existence of distinct and well-marked groups in parts of the world the most remote from any imaginable centre, such as Australia

and South America, was found to be inexplicable on that view, —a view which could only have risen among a people possessed of a limited knowledge confined to one region of the earth's surface. Hence arose the hypothesis of centres of creation, which we can only call provisional, but which still lingers in some quarters. This theory localizes the work of creation, not in one, but in a number of centres. It is incredible that the toucan and the prehensile-tailed monkey of South America should have been originally created in Central Asia, and should have wandered from thence to their present homes through climates suitable and unsuitable, and belts of ocean, without leaving a trace behind. What magnetic power could have attracted whole groups of species in that special direction in a course so orderly that not a straggler was left on the way? It was a natural and scientific deduction (strictly scientific in that, while creating a new hypothesis to meet new facts, it abandoned the former one as little as might be) to suppose that at least these abnormal groups were created in the country in which they are now found. Moreover, it was obvious that some countries had more energy of production than others; they were, so to speak, foci from which the surrounding countries derived their inhabitants. If we compare this conception with the facts we have already referred to, we shall find that it fits them much better than the older ones. If all the species of quadruped and bird radiated ready-made from Central Asia, why the break of continuity between Bali and Lombock? Whence comes it that Western types prevail on one side of a narrow sea, and Eastern types on the other side? But if we assume two such centres, it is easy to conceive that the intermediate islands would display a mixture of productions, the Asiatic type predominating in the Western members of the series, and the Australian type in the Eastern; and thus the hypothesis explains the broad facts. When we look a little closer, however, into the differences between island and island, when we try to distinguish between identity of species and similarity of type, we are struck with a variety of facts which require a new principle to interpret them —that of variability of species. This variability, in a modified form, and as an accompaniment to the hypothesis of creative centres, is now pretty generally admitted. After all, Mr. Darwin's work has mainly been to expand and extend the principle. If it is faithful in few things, why not make it ruler over many things? If it must be called in to explain one fact, what hinders that it should not be the explanation of all? Take a

fact, one of many similar facts in the book before us;—two adjacent islands are inhabited by two species of ground-pigeon, like each other but distinct. The theory of a separate creation of ground-pigeons on each island assumes so much to explain so little, that it is rightly given up. "We admit," says the specialist, "that at some distant period pigeons of the one island may have flown or been floated over to the other; and that ages may have increased and developed the variations, perhaps at first accidental, which distinguished those pigeons from the rest of their stock; but we totally demur to accepting any such view of the formation of the original ground-pigeon. We will go one mile with you, being compelled, but not twain. If we give up our species, we will at least hold fast to our genus." Thus, or somewhat thus, reason the more timid class of naturalists, vainly striving to give a physical significance to the metaphysical abstractions "genus" and "species," or merely shifting the difficulty, for it is as hard to prove that the characters which form a genus are essential, and incapable of being produced by a sufficiently long series of modifications, as to prove the same theme with regard to species.

But we are not emulating the reticence we have admired in Mr. Wallace, and must return to our appointed task of showing what lessons may be deduced from the facts which he records. We have observed that the hypothesis of special centres fits the facts better than the exploded doctrine of a general centre, or the unphilosophical doctrine, patronized by Professor Owen, of occasional creative efforts, scattered over all space and time, which brings us back into the region of miracle. It is undoubtedly true that some countries are distinguished above others by the variety and peculiarity of the forms of life which inhabit them; as we have seen in the case of Australia and India, they feed neighbouring countries, and radiate animal and vegetable forms into surrounding lands. Now, why is this so? If, from its incapacity to explain other orders of facts, we are compelled to give up the special creation hypothesis, whence comes this element of truthfulness in it? Why, for instance, should the island of Timor depend for its fauna and flora on adjacent countries? Why is it more deficient than they in original types? For the simple reason, Mr. Wallace would answer, that it is a newer country. The great Australian continent, the great continent of Asia, have existed for a long series of ages as continents, while the chain of islands which connects them is comparatively newer soil; or,

(which is the same thing as regards animal and vegetable life), has suffered submersion for a series of ages while they continued to exist as dry land. The presence of a line of active and extinct volcanoes running through the chain—forty-five in Java alone—points to the existence of great submarine volcanic forces acting in the line from east to west. Here we have amply sufficient cause for any hypothesis of subsidence and elevation which may be required to explain the other facts. To go further into detail, we find that the western islands of the chain rise from a shallow sea. The straits between Sumatra and the Malayan peninsula, between Sumatra and Java, the wider belt of ocean between both these islands and Borneo, can everywhere be sounded by the hundred-fathom line, and in most parts by the fifty-fathom line, while the eastern islands, Lombock, Flores, and Timor, rise out of a great depth of sea. There is, therefore, no difficulty in supposing that Sumatra and Java were formerly a part of the Asiatic continent,—a great prolongation of that continent towards the south-east. This would amply account for the similarity of their faunas,—a similarity extending even to those species of mammalia which could not swim across a strait, however narrow. Now, to change this great continental peninsula into two or three separate islands, we must postulate a subsidence, and this is sufficiently accounted for by the accumulated action of a great line of active volcanoes, continually sucking up the substrata, and disgoring them in heaps around certain points; what was continuous flat land would thus become isolated masses of high land. But the eastern islands, surrounded by deep sea, can never—never, that is, under the existing order of things—have been connected with either of the great mainlands on either side of them. Timor may have been much nearer Australia than it is at present; for the submarine bank which fringes the north-west corner of Australia, approaching Timor within twenty miles, indicates a recent subsidence of the northern part of the Australian continent; but between Timor and the bank there is an unfathomable depth of sea. Now, geology tells us that Timor and the adjacent islands are new land, that is, they have been submerged within a recent geological period, while Australia remained solid ground, and was continuously capable of supporting animal life, so that its animals are probably the legitimate descendants of those which dwelt there during the Eocene and Miocene periods. On the other side the islands of the Timor group are separate from

those of the Java group, formerly, as we have seen, continuous with Asia, by a strait equally wide and equally primeval with that which separates them from the Australian bank. These islands then we should expect to find peopled by stragglers from both sides, presenting an admixture of the types of both countries without special types of their own; and this is precisely what the naturalist tells us. Further, we have seen that the connection with Australia was once far closer than it has been for ages past since the subsidence of the bank, and that it is now virtually closed, for few birds or mammals could, even by accident, find their way across 150 miles of sea; the connection, on the other hand, of the most westerly island of the Timor group—Lombock—with Java, has remained persistently the same, whatever changes may have happened to Java in the meantime; we should expect, therefore, that the animals of the group would present a *generic* resemblance to the Javanese fauna about equal with that which they show to the Australian, for the straits having been once equally narrow on each side, the same number of types may have crossed from each country; but we should expect a greater number of *specific* resemblances to Javanese animals, because, while the narrow strait on the Australian side has been replaced by a wide belt of sea, thus cutting off the access of new individuals, there may have been from the Javanese side a continual influx of such, which, mixing with the individuals already established in the islands, have preserved a unity of type. The Australian species, left to themselves, would have opportunities for a separate development; the Javanese would preserve their specific identity with the species of the mother-country. These are the conclusions which would be drawn *a priori* from the geological facts; let us now see how far they suit the zoological facts, confining our attention in the present case to the group of birds, which is sufficiently large and well known to produce appreciable and correct numerical results. "The Timor group of islands contains," says Mr. Wallace,*

Javan birds	36	Australian birds	13
Closely allied species	11	Closely allied species	35
Derived from Java	<u>47</u>	Derived from Australia	<u>48</u>

"We have here," he continues, "a wonderful agreement in the number of birds belonging to Australian and Javanese

* Vol. i, p. 322.

"groups, but they are divided in exactly a reverse manner, three-fourths of the Javan birds being identical species, and one-fourth representatives, while only one-fourth of the Australian forms are identical, and three-fourths representatives,"—which is precisely what we were prepared to expect.

We have considered the Timor group for convenience as a single island, but we must not forget that it consists of a number of islands separated by straits as wide and deep as those which divide the group from neighbouring lauds. We shall, therefore, expect to find the birds of the more eastern islands approximating more closely to the Australian type, and those of the more western to the Javanese; that it is so, the following table will show:—

		In Lombok.	In Flores.	In Timor.
Javan birds	...	33	23	11
Closely allied to Javan birds	...	1	5	6
		—	—	—
Total	...	34	28	17
		—	—	—
Australian birds	...	4	5	10
Closely allied to Australian birds	...	3	9	26
		—	—	—
Total	...	7	14	36
		—	—	—

These tables, we think, furnish abundant proof of the thesis that a new country obtains its inhabitants from adjoining lands, and we have now sufficiently illustrated Mr. Wallace's method, which, combining the facts of geology, of geography, and of zoology, gives their joint weight to the conclusions to which it leads. We may proceed to sketch, far more briefly, the result of his inquiries in other parts of the Archipelago.

The great line of demarcation separating two groups of islands, strongly contrasted in many of the aspects of life, is a line which, intersecting the southern boundary of the Archipelago between Bali and Lombok, proceeds northwards between Borneo and Celebes, and then, turning to the west, separates Mindanao and the Philippines from Gilolo. To the west and north of it, we have Borneo, Sumatra, Java, the Malayan Peninsula (essentially belonging to the group), Mindanao, the Sula Archipelago, and the Philippines; to the east and south, the Timor group, from Lombok eastward, Celebes, Gilolo, Bouru, Ceram, and the Moluccas, the Aru group, and the great island of New Guinea. The first region is eminently Asiatic; the latter Polynesian, forming a portion of what has

been called by a pardonable bull the great Polynesian continent. If we were disposed to quarrel about words, we should demur to Mr. Wallace's terms—Indo-Malayan and Austro-Malayan—as applied to these two divisions, for the Malay element is in the latter of the two rather intrusive than indigenous, and the words Malayan and Papuan groups, taken from the predominant race on each side, would more happily describe the contrast. The Malayan region includes, besides the great south-western islands, the Philippine Archipelago, of which, as Mr. Wallace did not visit it, we may be content with observing that it presents many features connecting it with the Asiatic continent, together with some anomalies which indicate an earlier separation from the mainland than that of the islands we are about to describe.

We have seen that Java, Sumatra, Borneo, and the Malayan Peninsula, are connected with each other by a shallow sea, which also includes the whole of the Gulf of Siam, and the channel between Borneo and Cambodia; and that their productions are for the most part identical with those of the mainland. Plants of Ceylon, the Himalaya, the Nilgiri, and the Khasia Hills, recur in Java and the Peninsula. The cultivated plants are almost identical with those of India, and the general character of Javan agriculture, as described by Mr. Crawford, precisely resembles that to which we are habituated in Bengal. Rice is the staple; on the mountains wild tribes clear little spots for its culture by cutting down the trees and burning the underwood, and abandon them after a year or two.* This is identical with the *jooming* system of Chittagong and the Khonds of Orissa. In the plains, we get the culture of the high and dry lands, the lowland culture of the rainy season, and that which requires artificial irrigation. The villages embowered in groves of mango and tamarind, the garden as well as the field, are essentially Indian in aspect, while the forest-jungles, with their palms, rattans, orchids, and tree-ferns, are the counterpart of the lower ranges in Sikhim and Cachar. Turning to the animal world, we find the mammalia represented in all the islands by species identical or allied with those of India. The gibbons and monkeys are similar, though not the same; tigers and leopards abound, and the Malayan bear closely resembles the Thibetan. The elephant and both rhinoceroses of the islands are Indian. Altogether there are 48 species common to the peninsula and the islands, some of which, as the monkeys and squirrels, are incapable

* Crawford's *Indian Archipelago*, i. 360. Lewin's Report, 10

of crossing even a narrow sea. Borneo, 200 miles (now) from Sumatra, has thirty-six species of mammals in common with it. Java and Borneo, still further apart, have twenty-two common species. All these facts point to a time which geologists would call recent, when these sea-barriers did not exist. The distribution of birds supplies a still stronger argument. Few groups can cross wide seas, and of 350 land birds inhabiting Borneo only ten have passed the Straits of Macassar into Celebes, while at least a hundred are common to Borneo and Java, separated at the present day by a much wider belt of sea.

A similar collation of facts points out that of all the islands Java has been the longest isolated; and Mr. Wallace thus sketches (vol. i, p. 230) the probable course of events:—"Beginning at the time when the whole of the Java Sea, the Gulf of Siam and the Straits of Malacca were dry land, forming with Borneo, Sumatra and Java, a vast southern prolongation of the Asiatic continent, the first movements would be the sinking down of the Java Sea, and the Straits of Sunda, consequent on the activity of the Javanese volcanoes along the southern extremity of the land, and leading to the complete separation of that island. As the volcanic belt of Java and Sumatra increased in activity, more and more of the land was submerged, till first Borneo, and afterwards Sumatra, became entirely severed. Since the epoch of the first disturbance several distinct elevations and depressions may have taken place, and the islands may have been more than once joined with each other, or with the mainland, and again separated. Successive waves of immigration may thus have modified their animal productions, and led to those anomalies in distribution which are so difficult to account for by any single operation of elevation or submergence. The form of Borneo, consisting of radiating mountain chains with intervening broad alluvial valleys, suggests the idea that it has once been more submerged than it is at present (when it would have somewhat resembled Celebes or Gilolo in outline), and has been increased to its present dimensions by the filling up of its gulfs with sedimentary matter, assisted by gradual elevation of the land. Sumatra has also been evidently much increased in size by the formation of alluvial plains along its north-eastern coasts."

This narrative, though it does not explain, hints the possibility of an explanation of several peculiarities in detail, which have not yet been noticed; for instance, the greater similarity between Java and India than between Sumatra, or even the

Malayan Peninsula, and India. A rhinoceros is common to Java and Burmah, while the intervening countries present a different species; and among birds there are several instances of the same character. This connection indicates to Mr. Wallace's mind, perhaps too prone to the gigantesque, and playing with continents and islands as a child with its toys, a period when Borneo and Sumatra were submerged, and on their re-appearance connected with the Malayan peninsula, while Java, remaining isolated, conserved a type of life which belonged to the original connection with the mainland; the actual fauna and flora of the first two islands are thus supposed to be the result of a re-peopling by a second wave of life from the peninsula alone, and not, as before, from the mainland. Truly, the rhinoceros of Java is a troublesome animal, requiring so many revolutions of land and sea to get him into his place! But if we at all follow the argument, it is not yet complete, for when Sumatra and Borneo, on their re-appearance, were connected with the Malayan peninsula, what should hinder the rhinoceros of Burmah from finding its way into those islands through the peninsula, unless we further postulate the submergence of the isthmus of Mergui? Might not the explanation be sought in a simpler way? We have seen how closely the aspect of the country in Java resembles that of India; and we can understand that the similarity of aspect, partly producing, and partly produced by, a similarity of vegetation, and connected with a similarity of climate, might have had peculiar attractions for many species of mammalia and birds. The rhinoceros of Burmah and the Sunderbuns may, in the course of its wanderings, have found in no intermediate spot conditions of life so suitable to it as in the two extremes; and the same case may have happened to many a bird, as we know it has happened to man, whose impulses of selection are influenced to a greater extent than many suppose by the external conditions of soil and climate. The Hindu, with his religion, his caste, his language and his architecture, set firm foot in Java, while in Sumatra and Malacca scarcely any traces of him are to be found.

The naturalist is surprised and delighted, when, on ascending some tropical mountain, he seems to return for a period into his native air, and finds, perhaps upon the very equator, the identical flowers and plants which had been the associates of his boyhood. Such were Dr. Hooker's feelings on discovering at the head of one of the Sikkim passes *Thlaspi arvense*,

the common Shepherd's-purse of England; and Mr. Wallace's on the ascent of the Pangerang Mountain in Western Java, where he found at 8,000 feet honey-suckles, St. John's-wort, and guelder-roses, and at 9,000 feet the rare and beautiful Royal Cowslip, *Primula imperialis*, which he figures on page 183 (vol. i.). Mr. Motley gathered twenty European genera on this mountain, including four or five identical species. Such a fact—of plants occurring on an isolated peak, thousands of miles from the nearest of their congeners—can only be explained by causes of a cosmical nature. We know that Europe displays manifest signs of a comparatively recent glacial period; we find them in boulders spread over its plains, in the striæ produced by ice on the rocky sides of the pass of Llanberis, and above all in the boreal forms of plants which occur on the summits of the Alps and Pyrenees, and elsewhere only in the extreme north; all which indications point to a depression of temperature throughout Europe sufficient to float ice over the surface, and to enable plants to cross plains where now they could not exist. As the cold gave way to heat, these northern forms were driven higher and higher up mountain peaks, till now they are found congregated on the summits. The observations made in Java lead us to extend our views so far as to suppose that when an arctic climate prevailed in France and England, a temperate one extended to the very equator, bringing with it northern forms which, as on the Alps, have retired to mountain summits, like those primitive races of men which in India and elsewhere successive immigrations have driven from the plains into inhospitable mountain regions and impregnable forests.

The Austro-Malayan, or, as we have called it, the Papuan, region breaks up naturally into four groups,—the Timor group, of which we have already said as much as is needful, Celebes, the Moluccas, and New Guinea with its dependencies.

Celebes exhibits some striking peculiarities in the distribution of life. In the centre of the Archipelago, between the Moluccas, the Timor group, the Philippines and Borneo, with all which it is closely connected by small islets and coral reefs, we should expect to find in it a sort of common ground uniting the characteristics of all the neighbouring countries, and very rich in species. On the contrary, the number of species is small, and they are for the most part of very peculiar types; while the closest relation it shows is to the distant Island of Java. So deceptive is mere map-knowledge. Celebes, surrounded by

deep sea, presents every indication of a long-enduring isolation ; it is, on the whole, strikingly independent in its fauna, while some of its quadrupeds and birds so remind the naturalist of far-off African and Asiatic species, that he is tempted to the boldest speculations on the origin of its animal life, which must date from a period when the distribution of earth and water on the surface of the globe was very different from that which now prevails, and must have continued to develop itself with very little foreign admixture during the long course of succeeding ages. Of eighteen pigeons in Celebes, eleven are peculiar to it ; of ten parrots, eight are peculiar ; of 128 land birds (including 20 of very wide distribution, found in all the islands,) 80 are entirely confined to the Celebesian fauna,—“ a degree of individuality, which, considering the situation of the island, is “ hardly to be equalled in any other part of the world.” Many of these, too, are very remarkable in form, as the racket-tailed parrots, two very peculiar cuckoos, two genera of doubtful place in classification, assigned by some to the magpies and by others to the starlings, and the *Basilornis* with a beautiful compressed scaly crest of feathers. Of the mammalia, we may notice five distinct squirrels, and two distinct opossums, marking the eastern and western limits of their respective groups ; for no squirrel is found to the east of Celebes, and no marsupial to the west or north of it. A very peculiar baboon abounds over the island. The Anoa is a ruminant so remarkable in structure, that naturalists doubt whether it should be classed as ox, buffalo, or antelope. The Babirusa (pig-deer, or rather deer-pig) is a hog with long and slender legs, and curved tusks which grow upwards (from the upper jaw) out of bony sockets on either side of the snout, curving backwards to near the eyes, and having the appearance of horns. It has been supposed that they serve to guard the eyes from spines, while the animal routs up fallen fruit among tangled thickets of rattan. But the female, who must seek her food in the same way, is destitute of these appendages ; and Mr. Wallace thinks it more probable that they are relics of a past condition of life in which they were useful. Surely this reasoning is somewhat defective, for in the first place, there are numerous instances of peculiarities possessed by males, which might have been equally useful to their females, such as the horns of deer. The process of selection operates in a different way on the two sexes, for the females are selected by the volition of the males, which does not appear among animals to be guided by any sense of

beauty or suitability, but by mere chance contiguity ;* while the selection among the males is, in the true sense of the word, a *natural* one ; nature herself chooses the strongest and the fittest to propagate the species ; thus, while the males become stronger and fitter for their conditions of life in every generation, the females present no marked improvement of type. The does of different species of deer are much more like one another than the males, both in colour and size, and in the absence of horns, and probably resemble more closely the original or *archetypal* deer ; hen pheasants and birds-of-paradise are quiet quaker-like creatures, destitute of the bright colours and gorgeous appendages of the other sex. Of course these conditions are sometimes reversed, and in many classes we find a natural selection operating on the female, especially in animals of a solitary life, where the female has to protect her own cubs, and where, as the more powerful she is, the better can she protect them, the stronger female is more likely to bring her offspring to maturity ; but in the gregarious and polygamous races selection works almost exclusively on the males. Thus an organ which gives any advantage in the struggle for life will be developed in one sex, while in the other it remains insignificant. Secondly, if the babirusa's tusk is of no use in its present habitat (and if so, it is hard to say in what conditions of life it could be useful), how comes so unnecessary and seemingly inconvenient an appendage to have been preserved ? Would it not be, to use a familiar expression, *in the way*, as soon as it had ceased to be of use, and would not natural selection then work reversely, giving the advantage to those individuals whose tusks were least abnormal, till at last the mouth of the babirusa *developed back* into an ordinary pig's snout. It may be presumption to argue with Mr. Wallace ; but if what we have urged be admitted, those who have taught us to think will be proud to be worsted by their own weapons.

To return to Celebes ; the insects display as marked peculiarities as the birds and mammals. We shall hereafter have occasion to refer to the peculiar Celebesian contour of wing, by which a butterfly might be picked out from a collection as a Celebes species, by a naturalist who had never seen it before. About seventy per cent. of the butterflies in Celebes are found in no other island ; while not thirty per cent. of those in Borneo are peculiar. But the relations with distant

* Even in the human race, according to Clough, love is often simple "juxtaposition".

countries are even more remarkable than the peculiarities. The nearest kindred of the anoa are the *gnus* of South Africa; the nearest kindred of the babirusa is the wart-hog of Africa. *Scissirostrum*, a very peculiar type of bird, is allied to the ox-peckers of Africa. There a bee-eater, *Meropogon*, of which the only near ally was discovered by M. du Chaillu; and lastly the roller of Celebes is quite cut off from its congeners; "there are species of *Coracias* in Europe, Asia and Africa, but none in the Malay peninsula, Sumatra, Java, or Borneo. The present species seems, therefore, quite out of place; and what is still more curious is the fact, that it is not at all like any of the Asiatic species, but seems more to resemble those of Africa." Have we then in Celebes a fragment of Africa which has been bodily transplanted in the seas far east of Asia, like the Himalayan mountain which was brought by the sage in the Rámáyana, with all its animals and caves and holy hermits and trees and medicinal plants, for the healing of the monkey warriors that lay dying and dead around the walls of Lanka? Or shall we rather adopt the dream, almost as mysterious, of a time when the Indian Ocean from Madagascar to Celebes presented one continuous forest, along which the lemur and lori swung themselves from tree to tree, accompanied by the birds of the jungle, and the dark-skinned Negrito, whose progeny still inhabit the Andamanese thickets, and the mountains of Mindanao?

The Moluccas form a scattered group of islands large and small. Gilolo spreads his huge limbs around in every direction in imitation of Celebes; Ceram lies from east to west two hundred miles in extent, with Bouru, another large and little-known island, to its west. Better known to fame are some of the innumerable islets, that lie scattered in the straits and bays of the larger islands; for Ternate and Tidore are embalmed in a verse of Milton; Amboyna is the capital of the Moluccas, and Banda, crowned with its ever-smoking volcano, the great nutmeg-garden of the world. Like Celebes, the group is connected by strings of islets with four of the other five divisions of the Archipelago; but its zoology shows New Guinea to be the metropolis which supplied it with life. The land mammals are few in number: and many of them may have been introduced by native praus. The Malays are fond of taming deer, and a shrew or small rodent often finds its way into boats. In short, except their pig, the only land animals peculiar to the Moluccas are four which belong to the marsupial group, so characteristic

of Australia, and extending also into New Guinea. These islands, then, we may assume, belong to the Australian region, and form, as it were, the advanced guard of the great Australian continent. The birds teach us the same lesson. We have seen how closely akin the birds of Java and Borneo are to those of the Indian continent, and we have observed even in Celebes a marked resemblance to them. In the Moluccas, which possess probably as many species of birds as all Europe, this class displays a totally different aspect from that which it presents in India. Here most of the birds belong to sombre-coloured groups, but the thrushes, warblers, and finches are almost unknown in the Moluccas. Pheasants, woodpeckers, and jays have disappeared with them, and their places are filled up by groups of birds remarkable for the brightness of their plumage, the stately bird of Paradise, the brilliant parrots (including that very Australian form, the cockatoo) and pigeons of the loveliest hues. The bird population points immediately to New Guinea, remotely to Australia; the brush-turkey and the cassowary are characteristic of the latter region, while the resemblance to New Guinea is sufficiently proved by the fact that of 78 genera occurring in the Moluccas, 70 are characteristic of New Guinea, and six only of the western islands. It may then be laid down as established that the Moluccas have been stored with land animals principally from New Guinea, and from a comparison of species with species, we may further learn that—three-fourths being peculiar to the Moluccas, and many peculiar to single islands—the group must have existed in its present isolated form, separate from New Guinea, and composed of distinct islands, for a sufficient length of time to mould the species originally introduced into new forms. Indeed Mr. Wallace argues that these islands are not fragments separated from New Guinea, but from a distinct insular region, which has been independently upheaved at a remote epoch; but if this is the case, what should have determined the stream of immigration from New Guinea in preference to other regions, such as the ancient Celebes, which are equally near, or as closely connected by intervening islets? Should we not in that case have had a repetition of the idiosyncrasy of Celebes, and perhaps a repetition of its poverty? As the land and water now lie, it is inconceivable that 70 or 80 genera of land birds—many of them short-flighted, and one literally wingless—could have found their way into the Moluccas, and from one island to another, since the beginning

of time. We have a right then to infer a former attachment of the Moluccas to New Guinea, or at least a much closer connection than at present exists.

We now come to New Guinea, which, with the islands joined to it by a shallow sea, constitutes the Papuan group, the last with which we shall have to deal. New Guinea has been but very partially explored, and its natural productions have only been collected on the semi-detached peninsula to its north-west. Mr. Wallace observes that the main body of the island is the greatest *terra incognita* that still remains for the naturalist (excepting, we presume, Central Africa); and its richness may be conjectured from the fact that a partial exploration of the one known peninsula has produced no less than 250 species of land-birds, many of them of very remarkable types. Indeed, as far as birds are concerned, New Guinea can almost take rank as one of the primary divisions of the earth. Not to speak of the birds of Paradise, "among its thirty species of parrots" are the Great Black Cockatoo and the little rigid-tailed *Nasi-terna*, the giant and the dwarf of the whole tribe. The bare-headed *Dasyptilus* is one of the most singular parrots known; "while the beautiful little long-tailed *Charmosyna*, and the great variety of gorgeously coloured lorries, have no parallels elsewhere. Of pigeons, it possesses about forty distinct species, among which are the magnificent crowned pigeons now so well-known in our aviaries, and pre-eminent both for size and beauty; the curious *Trugon terrestris*, which approaches the still more strange *Didunculus* of Samoa; and a new genus (*Henicophaps*), discovered by myself, which possesses a very long and powerful bill, quite unlike that of any other pigeon. Among its sixteen kingfishers, it possesses the curious hook-billed *Mucrorhina*, and a red and blue *Tanysiptera*, the most beautiful of that beautiful genus. Among its perching birds are the fine genus of crow-like starlings, with brilliant plumage (*Manucodia*); the curious pale-coloured crow (*Gymnocorvus senex*); the abnormal red and black flycatcher (*Peltops blainvillii*); the curious little boat-billed flycatchers (*Machæirrhynchus*); and the elegant blue flycatcher-wrens (*Todopsis*)." * The geographical relationships of the birds are such as to puzzle even Mr. Wallace, usually so fertile in hypothesis. In the first place, we have a double, or give-and-take, relation with Australia; that is to say, many genera have their head-quarters in Australia, the Papuan

* Wallace, ii. 430.

species being stragglers from that country while there are some groups more especially characteristic of New Guinea, such as the Paradise-birds, which penetrate also into North Australia. Again, there are genera, as we have seen, exclusively found in New Guinea, and there are those which it has given to the Moluccas; and lastly, there is an inexplicable connection with Indo-Malayan countries; birds such as the Maina, not seen in the Moluccas or Celebes, recur in New Guinea, more than a thousand miles from their nearest allies. How did they come there? How could they have passed a thousand miles of sea without leaving any trace on the large and rich islands which stud the intervening space? May we admit to our minds the hints which Mr. Wallace shadows forth of a time when dry land connected Java and New Guinea, and of its later submergence into the ocean, followed by the appearance of Celebes and the Moluccas? To Mr. Wallace such speculations have nothing overbold; to a mind accustomed to the contemplation of vast spaces of time during which enormous changes are produced by the accumulation of slight changes, land and sea seem to have lost their stability:—

The hills are shadows, and they flow
 From form to form, and nothing stands;
 They melt like mist, the solid lauds;
 Like clouds they shape themselves and go.

But Mr. Wallace, like many pioneers of speculation, may perhaps be too prone to bring his favourite theories into play. There are cases where he brings such an accumulated weight of evidence in support of some vast change in the relations of land and water, that we are at once convinced. In other cases he puts his theories forward cautiously, like feelers, without the hope of establishing them; and we require for conviction the support of additional evidence drawn from other branches of Natural History. For instance, the hypothesis we have referred to assumes a comparatively recent emersion of Celebes; we do not know how far this would be borne out by geological research; Mr. Wallace's own enquires have convinced us that Celebes is a remarkably ancient land in its present isolated state; and if a Malayan fauna has ever reached Papua, we should be inclined to trace it from Java, through the southern chain of islands. But the botanist, as well as the geologist, should be heard before our minds are made up; it is the concurrence of evidence that produces conviction.

One point is clear, that the fauna of New Guinea is, *for the most part*, derived from the Australian continent: and this fact

absolutely distinguishes it from the western side of the Archipelago. Even in the explored peninsula, the furthest part of the island from Australia, half the birds are of Australian forms, and the few mammalia which have as yet been discovered point more distinctly still to this origin. Except a pig, which must have a western ancestry (pigs are good swimmers), and the bats, all the mammalia are marsupials, and they include two species of true Kangaroos. What renders the similarity of productions more striking is the great dissimilarity of external conditions—"Australia, with its open plains, stony deserts, dried-up rivers, and changeable temperate climate; New Guinea, with its luxuriant forests uniformly hot, moist, and evergreen,"* are regions as unlike one another as can well be imagined.

The Aru islands have been well studied by Mr. Wallace, who resided there during the first seven months of 1857, and whose peaceful security, alone among absolute savages, contrasts strangely with the anxiety and the sufferings of his countrymen in India during that eventful period. The Aru islands are situated about 150 miles to the south-west of New Guinea, in the shallow sea which connects New Guinea with Northern Australia. They consist of a large central island surrounded by lesser ones, and traversed by three narrow channels, which, though called rivers, and having precisely the aspect of rivers, are in reality arms of the sea. The country is flat and principally composed of coralline limestone; and Mr. Wallace has no hesitation in concluding that it once formed a part of New Guinea; and that its river-like channels are in reality the lower courses of rivers which now *débouche* into the sea far to the east. The subsidence of the intermediate country must have taken place without affecting to any great extent the portion which now forms Aru. Here is a conclusion which seems probable enough, as it is the only way of accounting for the river-like channels, which are too regular in width and depth, and too sinuous to be the result of fissures of upheaval, or to be due to the action of winds and currents; and the collections made by Mr. Wallace fully confirm it. Of 100 species of land-birds collected in Aru, eighty have been found in New Guinea, including a wingless cassowary, two brush-turkeys, and two short-winged thrushes, incapable of passing 150 miles of open sea. In Ceram, on the other hand, about the same distance from New Guinea, only 20 per cent. of the birds, instead of 80, are identical

* Wallace, ii. 436.

with those of New Guinea; and these are not terrestrial or forest-haunting species. A kangaroo and other mammals are common to Aru and New Guinea, but not found in Ceram; and the butterflies of Aru are all New Guinea species, or closely resembling them, which is not the case in Ceram. A combination of observations, such as this, cannot be withstood, and the enquiries of a botanist would doubtless lead to the same results.

We now proceed to sketch some of the more interesting features of the natural history of the islands without special reference to geographical distribution; and, reserving to the last the wanderings of man, we shall commence with those man-formed apes which are at once the puzzle of the naturalist, and the bugbear of the theologian; *—so like ourselves and yet so unlike. The orang-utan, or, as the Dyaks call it, Mias, inhabits Sumatra and Borneo, but is rare in the former island. He is found only in a swampy country covered with virgin forest, where he can roam in every direction, passing from treetop to treetop without once coming down to the ground. He walks half-erect along the branches, and occupies during the night a nest of dry wood, covering himself in wet weather with *Pundanus* or fern leaves. He pelts his pursuers with branches. The durian is his favourite food (wherein he resembles his historian), but all kinds of fruit tempt him. The mias is never more than four feet two inches in height, but from finger-tip to finger-tip reaches seven feet eight inches—an enormous expanse; and the old males are further distinguished by their breadth of face. Mr. Wallace shot several specimens of an allied species, the *Simia morio* of Owen, without the lateral protuberances of the face, and with broad upper incisors, but similar in habit and locality. He gives an entertaining account of his experiences in endeavouring to nurse a young mias, which appears to have resembled the human infant in helplessness as well as in other characteristics.

The Siamang of Sumatra is the largest monkey next to the mias. It is three feet high, and tail-less, swinging through the

* We might add, the torment of the logician, who is excruciated by arguments like these:—The Chimpanzee has a *hippocampus minor* in the posterior *cornu*, &c., and no soul; man also has a *hippocampus*; ergo, man has no soul. To which the only reply a learned Professor considers it possible to make is something of this sort:—man has a soul and a *hippocampus*; the chimpanzee has no soul, therefore no *hippocampus*; which is very good mediæval logic, but can hardly pass muster in a period of positive philosophy, which after all means only a rigid adherence to facts.

trees like an *Hylobates* with its enormously long arms. There are gibbons* (*Hylobates*) in all the Indo-Malayan islands; apparently a separate species in each, and also several kinds of monkeys proper, of which the most peculiar is the *Nasalis larvatus* of Borneo, which is as large as a three-year-old child, and has a fleshy nose longer than that of the biggest-nosed man. Nature is here clearly making fun of us. In Celebes there is a baboon, *Cynodithecus*, jet-black, with a dog-like muzzle, large red callosities, and an inch of tail. This animal marks the furthest eastern range of the quadrumana, and singularly enough, it is an allied species that stretches furthest to the north-west,—the well-known ape of the rock of Gibraltar.

The Archipelago possesses also a few of that curious group of nocturnal quadrumana known collectively as lemurs. The *Galeopithecus*, common in Borneo, has a membrane stretching all round the body, as far as the points of the toes and tail, which serves as a parachute, and enables it to fly or glide obliquely downwards from tree to tree. The lemurs belong especially to Madagascar, where their typical forms are found, but as after a long interval of sea they recur, mostly in aberrant forms like the one described, in the Malayau islands and India, some naturalists have jumped to the conclusion that a lost continent, to which they give the name Lemuria, formerly bridged the void, and connected Madagascar with the islands of the eastern sea. Some such theory seems necessary to explain the presence of African forms in Celebes, and we shall see that it would assist us to understand the distribution of man; but the evidence is as yet too vague to give the hypothesis the rank of a discovery.

We have incidently spoken of most of the other remarkable mammalia in the islands, and need only refer to the Marsupialia, which haunt the Papuan or Austro-Malayan region; some of these, as the kangaroos of New Guinea, are formed on the strictly Australian type; but the Moluccan *Cuscus* is a peculiar genus of small furry opossums with prehensile tails, very slow in movement, and wonderfully tenacious of life. A heavy charge of shot lodged inside them seems to do them no harm; and they will long survive even a broken spine. This quality marks them distinctly as low in the scale of organization.

* If Linnæus invented a scientific vocabulary, Buffon did his best to invent a popular one, and the compilers who follow him fill their manuals with semi-French words, which belong to no known language. Few of our readers, not brought up on Goldsmith's *Animated Nature* and such like pabulum, have ever heard of a gibbon, or recognize under that name the well-known *Huluk* of Assam and Cachar.

The birds formed the chief object of Mr. Wallace's wanderings, and he brought home a collection of about three thousand skins, including a thousand distinct species, which points to an exuberance of bird life surpassed in few countries. To this, of course, the insular nature of the region largely contributes. In the plains of the Amazon, a vast continuous space of uniform character, a single species often occupies without modification an immense tract of country; but a region which has for ages been broken up into islands tends to increase and perpetuate accidental variations, and we find in some groups, as the fruit-pigeons, a distinct species almost for every island. We cannot glance over the pages of this book without noticing the number of birds, many of them very abundant, which present some features of remarkable beauty of colouring or peculiarity of form. Of course it may be said that such species attract special notice, and that the inconspicuous crowd are passed over; but there remains a distinct impression that the birds of the Archipelago are far more brilliantly coloured as a whole than those of India. Here in Bengal a few of the common birds, such as the oriole, the bee-eater, the roller (nilkánth), the parakeet, and the Nectarinias, (falsely styled humming-birds*) strike the observer by the beauty of their plumage, but the bulk exhibit sober black and white, or the speckled browns and greys of the English thrushes and sedge warblers. We are hardly out of the temperate region in ornithology, while in Mr. Wallace's countries we pass into the midst of the tropics. We must refer to his own pages for full confirmation of these views. Here we can do no more than glance over a few of the more conspicuous groups.

The first place must be given to the Birds of Paradise, which formed one of Mr. Wallace's chief attractions, and to the knowledge of which he has largely added. A Paradise-bird stripped of its feathers is a sorry sight; the feet and beak are large, and the general aspect resembles that of a crow, which indeed belongs to the nearest family, but the

* The Anglo-Indian is peculiarly deficient in his nomenclature, and generally borrows the names of American animals, which are similar or supposed to be so. Thus, besides the instance quoted in the text, the hornbill is ordinarily called toucan,—a bird which it only resembles in the size of its beak; the crocodile and the garial become indiscriminately alligators; the python is called *boa constrictor*; the large rock-snake *anaconda*; the ratel is named sloth, and the great monitor lizard *iguana*; while, as regards confusion of description, who has not heard of monkeys hanging from the telegraph wires by their long prehensile tails—a feature unknown out of South America!

extraordinary developments of plumage effectually disguise the intrinsic ugliness of the bird. They were early an article of commerce, and as the feet and often the wings were removed for convenience, the most miraculous stories were told by the early Dutch voyagers, who had never seen them alive. They never lighted on earth; they came to Banda to eat nutmegs, which intoxicated them, and made them fall down senseless, when they were devoured by ants. Only in this century have they been seen alive, and by very few voyagers besides Lesson and our author; and several species are still known only from dried and mutilated skins. These are inhabitants of the mountain ranges in the interior of New Guinea, and are prepared for the market by the mountaineers; the Sultan of Tidore for the most part monopolizes them on behalf of the Dutch; and till New Guinea has been thoroughly explored, we must be content to know little about them. Two of the finest species, however, are found in Aru, and were well studied by Mr. Wallace. The Great Bird of Paradise is one of these, and perhaps the most lovely of all. The body is of a rich coffee-brown, the throat emerald green, the head yellow, the two webless feathers of the tail run to thrice the length of the body, forming long undulating curves; but the bird's glory is in the dense plummy tufts of orange-coloured feathers which spring out from underneath each wing. In the season of excitement the birds of the stronger sex (for the ladies are quiet quakerlike creatures of a uniform brown without any superfluity of feather) meet in dancing parties on the highest trees, where they lift themselves up and down and fly from branch to branch, elevating their plumes till they form two magnificent golden fans meeting above the bird. Oblivious of danger in their excitement, they are an easy prey to the hunter, who climbs the tree, conceals his person by a shelter of palm-leaves, and shoots them with knobbed arrows which stun without piercing. The *Paradisea papuana*, a similar but smaller bird, is the only species which has found its way alive to England. Mr. Wallace succeeded in bringing two specimens home, though he was much embarrassed by what our readers will consider a singular experience—the scarcity of cockroaches on board the P. and O. steamers. With strange perversity, these animals were not forthcoming on perhaps the only occasion on which any one ever wanted their presence. The *P. rubra* is found only on the small island of Waigiou, and though wanting the golden glory of the train, is a remarkable bird.

Its side plumes are short and stiff, and of a rich red, with white ends, and the middle feathers of the tail terminate in two long glossy black ribands, flowing in graceful curves.

In the Aru islands, after some days of enforced idleness, Mr. Wallace was beginning to despair, when his boy returned one day with a specimen which, he says, repaid him for months of delay and expectation. It was the Burong Raja or King Bird of Paradise. It was less than a thrush, of an intense glossy cinnabar red, shading into orange on the head and separated from the white of the breast by a band of deep metallic green: the bill yellow, and the feet and legs cobalt blue. Springing from each side of the breast and elevable at pleasure, were little tufts of gray feathers terminated by a broad band of intense emerald green; and the middle tail feathers were wires diverging in a beautiful double curve, and terminated each by a round button of green. No wonder Mr. Wallace thought it the most exquisitely beautiful of the eight thousand known birds, and felt for the first time that he had not come so far for nothing. That generations of such lovely creatures should be born and die through countless ages in the depths of a forest, in an almost unknown isle of the far Indian ocean, without an intelligent eye to gaze upon their beauty, shows the fallacy of the vaunt that all things were made for man.* Man comes upon the scene as the destroyer; he cuts down the forest, tills the soil, spreads his nets, loads his rifle, and exterminates the fairest objects of nature. The ordered monotony of the rice or maize-field is more fatal to bird or beast than all the hunter's efforts, and as human population increases, all the other denizens of the world, except those whom man has taken under his special protection, must dwindle and vanish.

The Magnificent Bird of Paradise has a wonderful ruff of straw-coloured feathers on the nape, and beneath it a second mantle of reddish brown; the whole under surface is green with changeable hues of purple; the cheek and throat rich bronze. The Superb, only known from skins, is black with metallic reflexions; has on its breast a satiny shield of bluish

* "Man," says a late *Quarterly Reviewer*, "is the revelation of a God in nature;"—a sentiment which would be more in place in Fichte than in the ponderous organ of orthodoxy. If he means to restrict his "argument of design" to the design manifest in the conscious mind, he cuts his own throat, and Paley's; if he wishes to assert that only mind can recognize creative mind, and that the trilobites of the Devonian period could not, he should confine his utterances to the nursery.

green, and on the back of the neck a larger one with lateral branches longer than the wing, of velvet black, glossed over with bronze and purple. The Golden has six wires on the head, each surmounted by a tuft of web; the Standard-Wing, one of Mr. Wallace's discoveries, is marked by a pair of long, narrow, erectile white feathers which spring from each wing. *Epimachus magnus* is a long-tailed and long-billed bird of the most vivid colours; and there are several allied species in North Australia.

This group is peculiar to the region we are describing, but there are other groups, if not equally characteristic, still more abundant. Of Parrots, we need only mention the diminutive lorikeet of Java, smallest of its tribe, the little long-tailed green, red, and blue *Charmosyna* of Gilolo, the racket-tailed parrots peculiar to Celebes and Mindanao, *Eos rubra*, the lovely crimson lory of Amboyna, and lastly the cockatoos, that essentially Australian group, of which we find a small white species with yellow crest very abundant in Lombock, and occasionally, it is said, passing over to Bali, a large red-crested species in the Moluccas, and in Aru the fine black cockatoo, with "an enormously-developed head, ornamented with a magnificent crest, and armed with a sharp-pointed hooked bill of immense size and strength" which it employs to crack the Canary-nut, whose hardness baffles every other bird. The numbers of the parrot tribe found in these islands, when compared with those of continental India, furnish an apt illustration of the remark we have already made on the great superiority of the islands in richly-coloured birds of the tropical type. Of the seven subdivisions of the parrot group, two only are represented in India, the *Palæorninæ* or Parrakeets, of which we have six species, and the lories, of which one species occurs in Assam and Malabar, while in Celebes alone there are ten parrots, in the Moluccas twenty-two species belonging to ten genera, and in the little-explored Papuan region no less than thirty species; and these represent four, if not five, of the seven subdivisions. It is a matter for regret that Mr. Wallace has not given us tabular statistics of the birds which he obtained; our information is to be gathered from scattered hints, and is necessarily very incomplete.

Another well-marked group, the Pigeons, of which Jerdon describes 28 Indian species, is still more abundant in the Archipelago. Papua alone (as we have seen) displays 40 species, including the *Trugon terrestris*, a ground dove, which approaches the strange *Didunculus* of Samoa, remarkable again

for its resemblance to that almost mythical pigeon, the extinct Dodo of the Mauritius. To illustrate the rich colouring of tropical pigeons we may refer to the *Carpophaga concinna*, or nutmeg-eating pigeon of Banda and the Kè Islands; it is twenty inches long, bluish white, with back, wings and tail of an intense metallic green, with golden, blue, and violet reflecticns; the feet coral-red, and the eyes golden-yellow. Upwards of 7,000 feet high on the Java mountains dwells a lovely pink and green fruit-pigeon, and this genus invariably displays brilliant colours, emerald green being the prevalent tint, variously adorned with carmine, lake, and bright yellow.

The Gallinaceous group are not abundant, not so much so for instance, as in the temperate countries of Asia, especially the Himalayas. But some remarkable species haunt the regions described by Mr. Wallace. The Argus pheasant, so conspicuous in museums from the development of its secondary wing-feathers and the rich eye-like spots that stud the whole of its upper surface, is scarcely ever seen in its native haunts, where it runs rapidly over dead leaves with which its colours harmonize. It is snared but never shot. This bird belongs to the Malay peninsula, and also to Sumatra. The *Polyplectron*, or ocellated pheasant, connects the pheasants with the peacocks, and the Fireback connects them with the jungle-fowl; both these genera are found in Sumatra and Borneo, but are wanting in Java. On the other hand, Java alone can boast the peacock, which is a different species to that of India, having more green and gold and less blue in its plumage. It is the peacock of the whole Eastern peninsula, from Burmah to Assam. The common jungle-cock of India, or a type so similar as to be hardly distinguishable,* abounds in Java and still further east, and Java also possesses the *Gallus furcatus*, green with bronzy feathers on the back and neck, with a smooth-edged violet comb and a large wattle brightly coloured in three patches of red, yellow and blue.

The *Megapodidæ*, mound-birds or brush-turkeys, are found only in Australia and a few of the islands; their peculiarity is that they never sit upon their eggs, but bury them in sand or rubbish, and leave them to be hatched by the heat of the sun or by fermentation. They rake together with their large claws dead leaves, sticks, stones and rotten wood, till they form an enormous mound in which they bury their eggs. A number of birds join in the formation of one of these mounds,

* See Jerdon, ii. 538.

which are sometimes six feet high, and contain as many as fifty eggs. The Maleo of Celebes belongs to this group, but she deposits her eggs in holes on the beach, just above highwater mark. The eggs are large and delicious, and much sought after by the natives; the young bird, if it lives to chip the shell, uncared for by the mother, runs off at once to the forest. It can fly the very day it is hatched. The bird is a very striking one, black and rosy white, as it stalks solemnly along with helmeted head and elevated tail.

We must pass lightly over the other groups; but we cannot forbear to mention the *Cymbirhynchus* of Malacca with its broad bill of vivid blue, contrasting with the black and claret colour of the plumage; the brilliantly green *Calypomena*; the green and brown cuckoos of Malacca with velvety red faces and green beaks; the large cuckoo of Celebes with a yellow, red, and black beak; the large green barbets patched with blue and crimson; the minivet fly-catcher* of Java which looks like a flame of fire as it flutters through the bushes; the blue and green ground-thrushes of Java and Lombok; the orange orioles; the racket-tailed kingfisher, with the two middle feathers of the tail immensely lengthened, and terminated by a spoon-shaped enlargement; the metallic green starlings; and the great two-horned hornbill which plasters up its mate and her egg with mud in the hole of a tree, and feeds her, during the period of incubation and till the young one is fledged, through an orifice left open for the purpose.

After the Birds of Paradise, perhaps Mr. Wallace's greatest enthusiasm was aroused by the insects; but here we cannot follow him so closely. The insects of the Eastern Archipelago present a general resemblance to those of India, and in Java many of the species are identical, though, as we have seen among the birds, the differences of type become more conspicuous as we advance eastward. The group of great butterflies called *Ornithoptera*, or birdwing, is known in India by a showy black and yellow species, the largest Indian butterfly, common in the gardens about Dacca, but not extending westward as far as Calcutta. The Eastern Isles are peculiarly rich in species. In Borneo, Mr. Wallace discovered the *O. Brookeana*, with long and pointed wings of velvet-black, adorned by a band of brilliant green spots; in Celebes, he found *O. remus*, "the largest, the most perfect, and the most beautiful of

* This group (*Pericrocotus*) contains some of the most beautiful birds, red and black, which are found on the continent of India.

"butterflies," of a shiny black, with the lower wings grained with white and bordered by large spots of the most brilliant satiny yellow. He trembled with excitement as he took it out of the net. Two other species inhabit the same island, wheeling through the thickets with a strong sailing flight. In the small Island of Batchian, he found another prize, the *Cræsus*, seven inches across the wings, which are velvety black and fiery orange. His heart beat violently, and he postponed his departure from the island for several weeks, which he spent in obtaining a set of more than a hundred specimens. In Amboyna dwells the *O. Priamus*, which naturalists from Linnæus downwards have placed at the head of the Lepidoptera; *Poseidon*, a magnificent green and black species, was taken at Aru; and another green one, represented by a single specimen, at Waigiou.

The genus *Papilio*, though much restricted, is one of the largest and finest groups of butterflies, containing notably in India the large red and black-tailed butterflies which sail magnificently through our gardens. Of the Eastern species, it is enough to mention the *Arjuna* of Java, whose wings are powdered with grains of golden green, like one of the Bengal species, if not the same; the black *Memnon* dotted over with lines and scales of blue; the bluebanded *Miletus* and green *Macedon* of Celebes; the *Blumei*, with azure spoon-shaped tails; and the brilliant blue *Ulysses*, so conspicuous in the cabinet. But we must pause to direct attention to a sexual peculiarity among insects of this genus,—one of those fertile discoveries which so often reward the labours of travelling naturalists like Wallace and Bates, but which the mere student of a cabinet can never expect to make. Certain butterflies of the genus *Papilio* have two forms of female, totally unlike each other, and one of them totally unlike the male. *Memnon* for instance, a tailless butterfly, has a tailless and a tailed female; and the latter is ornamented with stripes and patches of white so as to make it closely resemble another species, *P. Coön*. Both of these forms are the offspring of either, and no intermediate forms occur; which is as if a white man should have two wives, a black and white one, and while the male children always resembled the father, the female children of each mother were some of them black, and the others white. Parallel facts occur among other species. When Mr. Wallace announced his discovery some years ago at a meeting of the Entomological Society, General Harsey, if we remember

rightly, remarked that he had observed the same phenomenon among the common Papilios of Bengal, and Mr. Wallace records in this book an instance of two Papilios of Timor, *Enomaus* and *Liris*, of which the males are totally unlike, and belong to different sections of the genus, while the females are all but undistinguishable. The fact presents to us two problems of different orders—the physiological, with which Mr. Wallace does not deal, and the teleological; for the Darwinian naturalist recurs—for convenience—to the phraseology of final causes. The first problem we can only indicate, not solve,—how two forms bearing different sets of secondary sexual characters are simultaneously produced from a mother displaying only one of the sets. If we adopt the atomic theory of physiology enunciated in the last chapter of Mr. Darwin's last book—the “provisional hypothesis,” as he modestly calls it—it is intelligible that germs of the various parts derived from each of two distinct female ancestral types should recur in the offspring, but why the germs of each set should have so close an elective affinity for each other as to exclude any admixture of characters is the puzzling part of the problem. After all, however, the constancy of secondary sexual characters (that is, distinctions not connected with the sexual functions, such as that of colour) is in itself a problem: every male bird or butterfly reproduces its father, and every female its mother, down to the minutest marking of the wings or plumage, and although each individual derives its origin from both sexes, the characters of the two are never mixed. Yet more perplexing is the genesis of specific differences in those ants which have peculiar neuter forms, one or two to each species; for what is propagated in this case is not a set of characters which belonged to one sex of the ancestors, but a set of characters which no ancestors ever had, (for all which have possessed them are by the nature of the case sterile); or rather the power of producing neuters of such and such characters. But to return to our butterflies; teleologically, the case must be explained by some peculiar advantage derivable by the aberrant female from its mimicry of *P. Coön*, such as Mr. Bates has conjectured in the cases of imitation observed by him in South America.* Such mimicry is not uncommon in the animal world. The clear-winged sphinx-moths common in England (*Sesia* and *Ageria*) represent bees, wasps, and flies

* See *The Naturalist on the Amazons*.

of various species so closely as to deceive an ordinary observer and possibly a bird of prey. If in the course of promiscuous variation it proved that those moths which were the least downy in aspect, and most resembled sting-bearing insects of another order, were less liable than others to be snapped up, they would have better opportunities for propagation; the variation would become a selected one, and the accumulation of minute variations in the same direction would tend to establish an imitative species. The walking-leaf and the straw-like *Phasma* are thus explained, and many other facts to the same effect are collected by Mr. Wallace in an interesting paper in the *Westminster Review*. Two very striking instances occur in these volumes;—one of a butterfly in Sumatra (akin to a species common in the Western Himalayas), which in repose resembles a dead leaf almost to its minutest markings; and the other of an oriole in Bouru, which, in the colour of its plumage and even the structure of its bill, closely imitates a bird of an entirely distinct family—the *Meliphagidæ*; that is to say, a weak bird imitates a pugnacious one, obviously to its advantage. What one butterfly gains by imitating another, it is hard to say; perhaps the imitated species has a peculiarly acrid taste which renders it distasteful to birds.

The butterflies of Celebes have a peculiarity which, even in a crowded cabinet, betrays their habitat. The forewing is either strongly curved, or abruptly bent near the base, the extremity elongated and often hooked. No fact analogous to this has to our knowledge been anywhere noticed. The peculiar shape of the wing must correspond to some special advantage shared by all the groups which possess it; but there is nothing in the conditions of life in Celebes to distinguish it from the adjoining islands. Perhaps, in the long history of Celebes, insectivorous birds may have abounded to such an extent at some former time as to give insects with an elongated wing a considerably greater chance than their fellows; and a peculiarity of this kind, which could in no case be injurious, would not wear away, even when the necessity for it ceased.

In the other orders of insects, we cannot follow Mr. Wallace; suffice it to say that the Coleoptera are remarkable for their forms, and more so for their number; of 125,660 specimens of animals collected by him, 83,200 were beetles, and sometimes a day's work was rewarded by seventy distinct species.

Mr. Wallace is not a professed botanist, and his observations on the flora of the islands, though often interesting and

valuable, are devoid of the completeness and grasp which characterize his remarks on the mammalia, birds and insects. The botany of the islands is not at all unknown in detail; Java has been well explored, and the classical work of Rumphius on the flora of Amboyna, though belonging, like Lord Derby, to the pre-scientific age, is a store-house of information. But we want a naturalist of modern information and wide views, and habituated by experience, like Dr. Hooker, to the comparison of large masses of plants, to test Mr. Wallace's hypotheses by an analysis of the flora of the several islands. Some of these hypotheses we have already shown to be supported by such accumulated proof, that even without the botanical evidence, it is useless longer to preserve an attitude of suspense towards them: others require every confirmation which botany or geology can give them; in all cases further evidence from a new field is singularly satisfactory. Perhaps, at first the botanist would only increase our perplexity, We have already referred to the quasi-European flora of the Pangerang mountain in Java, and it seems that the plants of the highest mountain in Borneo are similarly related to those of Australia,—a cross connection which has nothing answering to it in the animal kingdom.

Plants travel faster and further than most animals. A seed will travel wherever a bird can carry it, and its fertility is seldom impaired by its passage through the digestive organs of the bird. The peepul that springs out of the dome of a mosque, the mistletoe that hangs from a tree-cleft—a mile perhaps from any other plant of the species—attest this; and the agency of birds probably does as much to propagate some orders of plants as that of insects does to fertilize others. But this is not all. How many seeds, especially among the *Compositæ*, are furnished with a *pappus*, which enables the wind to waft them to vast distances! How many drift on the waves to distant shores! There they are more easily accommodated than animals. If the broad general features of life—the soil, temperature, and humidity—are similar, a plant will accommodate itself to any home; whereas the conditions of a bird's or insect's life are far more diverse and complicated. The bird must have her special beetle for food, her special twig for nest-building; the insect, still more importunate, requires a special adaptation to its peculiarities in three distinct stages of life. Hence plants are, within due limits, wider in distribution than animals. But they are also more permanent; the balance

of species is less easily shaken ; if they distribute themselves more rapidly, they maintain themselves more firmly ; and thus the study of plants can teach us more of long past eras, and distant connections between continents, of which no trace remains, than that of animals. For these reasons, we look forward with the greatest interest to the scientific exploration of the Archipelago by a qualified botanist.

Meanwhile, Mr. Wallace's book abounds in interesting sketches and glimpses of the forest scenery of the islands. Borneo is the metropolis of pitcher-plants, which run along the ground or climb over stumps, hanging in every direction their elegant pitchers, long or short, green or mottled, some of which are twenty inches long and hold two quarts of water. The *Vanda Lowii*, an orchid growing on the lower branches of trees, has pendent flower-spikes six or eight feet long which almost sweep the ground. The *Polyalthea*, a genus akin to the custard-apple, has crimson star-like flowers clustering all over the trunk. The tree-ferns and stemless ferns, with fronds ten or twelve feet long, abound everywhere, and every forest is festooned by creepers. Rattan palms hang from the trees, and twist about the ground, in the wildest confusion,—a single palm sometimes ascending and descending several trees in succession. *Pandani* guard the beach like branching candelabra forty or fifty feet high, bearing at the end of each branch a tuft of immense sword-shaped leaves. Figs are seen, of which the aërial roots form a pyramid of near a hundred feet high, terminating just where the branches begin, so that there is no trunk. The palms of Aru display a hundred feet of smooth, straight, slender stem, crowned by drooping leaves. To turn from what feasts and surprises the eye to that which satisfies our grosser appetite, we need only speak of the Durian, the monarch of fruits, beset with a hard spinous covering that wounds a man fearfully in its fall, and almost defies opening, protected further by the most hideous of odours, yet wielding an irresistible impulse over all that have once ventured to taste it—witness Linschoten, Dampier, Crawford, Bastian and our author, who admits that the flavour of the pulp is indescribable, and straightway describes it as reminding him of a rich butter-like custard highly flavoured with almonds, intermingled with wafts that call to mind cream-cheese, onion sauce, brown sherry, and other incongruities ; while, wonderful to relate, it produces no nausea, and “ the more you eat the less you feel inclined to stop ” ; surely some ideal fruit, such as haunts the school-boy's dreams ! The bread-fruit grows

in Amboyna, and is baked entire in the hot embers, and eaten with a spoon. The tree can only be propagated by cuttings, as cultivation entirely aborts the seeds. But sago is the most remarkable production even of these fruit and spice-bearing islands, for it changes the whole character of the people. Rice-eaters have to labour for their food the whole year round, like the inhabitants of temperate climes; the people of the Moluccas can earn by eighteen days' labour raw sago enough for a year's food, and in ten days more can prepare it for eating. The result is that, as wants beget wants, they are idle and listless, and have fewer luxuries than even the savage Dyaks. The sago tree not only supplies an article of food, but is, like the cocoanut of Ceylon, used for almost every purpose. The mid-rib of the leaf can be made into roofing, panelling, and flooring for houses, and is the material for boxes and all sorts of carpenter's work; and the leaf itself is the universal thatch of the country.

In spite of the beauty and variety of the vegetation in these islands, Mr. Wallace makes the remark, which has been made by other travellers, that the flower-colouring of the tropics is not so striking as in temperate countries. His experience embraces the two worlds,—the islands of the Archipelago, and the forest-clad plains of the Upper Amazon; and it fully coincides with what we have all observed in India. Homestay-ing folk judge of the gorgeousness of the tropics by that of a hot-house at Kew, for which all the world is ransacked; and they forget that the floral splendour which so startles them, so far as it is tropical at all, is culled from the midst of dense and sombre leafage, through which you may travel for hours without meeting any conspicuous mass of floral colouring, such as in England gladdens our eyes at every step in “furze-clad com-
“mons, heathery mountain-sides, glades of wild hyacinths, fields
“of poppies, meadows of buttercups and orchids—carpets of yel-
“low, purple, azure-blue, and fiery crimson, which the tropics can
“rarely exhibit. We have smaller masses of colour in our haw-
“thorn and crab trees, our holly and mountain-ash, our broom,
“foxgloves, primroses and purple vetches, which clothe with
“gay colours the whole length and breadth of our land.” In Bengal, as we well know, such sights are never seen, or if seen, it is not in the jungle or the pasture-land, but where man's industry, for purposes other than æsthetic, has massed together flowering plants into an artificial semblance of English floral beauty, as may be seen, for instance, in the cold weather crops

along the Eastern Bengal Railway, where the patches of blue linseed, yellow mustard, and golden safflower, mixed with the bright green of the pepper-plants, and the glowing red heaps of their pods drying in the corner of the field, produce more pleasing effects of colour than could have been anticipated from so homely a source. In the jungles of the plains, a conspicuous flowering tree such as the Palas (*Butea frondosa*), is a grateful relief to the eye, and even in the Himalayas, the wonderful beauty of the vegetation will be found on analysis to depend more on the forms of leafage, the creepers trailing in the air, the arums and epiphytes concealing the trunks of the trees, the delicate fronds of ferns, the marvellous variety in the pods of papilionaceous plants, than in flowers of brilliant colour; the luxuriant leafiness dwarfs and hides the blossoms. The forests of magnolias and rhododendrons in Sikkim, belonging to a distinctly temperate region, furnish no arguments against our view.

The human inhabitants of the Archipelago remain to be considered; and in considering them, we shall select by preference those observations of Mr. Wallace, which deal with man as a subject of natural history. Not that Mr. Wallace falls into the materialist error of looking on *Homo sapiens* simply as one of the eight thousand species which fell under his notice; some of his most agreeable and interesting pages are devoted to the discussion of the social life of these Eastern tribes, their relation to Christianity and to modern civilization, and the various aspects of colonization. But on this last point, especially, we fear to venture beyond our depth, and, while cordially deprecating some of Mr. Wallace's conclusions, we hesitate to imitate him by instituting a comparison between two systems of dealing with Oriental populations, with one of which we are familiar, while the other is totally unknown to us, except from books. Mr. Wallace, like our fellow-townsmen Mr. William Money, whose book he quotes with approval, is a fervent admirer of the Dutch Government in Java; we, on the other hand, are perhaps a little prejudiced in favour of a system which leads rather than governs, which, confident in the elevation of its aims, trusts to the slow result of time to carry them out, and which has already produced the Hindu millionaire, the Calcutta University, and the Brahma Samáj. The Dutch, without doubt, get more from their Indian empire than we from ours: but whether they do more for it, is totally a different question.

Mr. Wallace divides the peoples of the Archipelago into four distinct classes; the Malays and Papuans, and two minor

classes, the Negritos and the inhabitants of Gilolo and Ceram whom he assimilates to the brown Polynesian type represented by the Sandwich islanders. He assigns to two of these classes, the Malays and the Negritos, an Asiatic origin; and to the other two a Polynesian origin,—a division which corresponds geographically with that which, as we have already seen, separates the Asiatic from the Australian fauna. Leaving for after-consideration the question of the source of the Negrito race, we find nothing at which we need hesitate in this conclusion: the Malays are without doubt closely related to the Chinese and the Siamese, and widely distinct from the New Zealanders or the Papuans. A line commencing to the east of the Philippine islands, thence drawn along the western coast of Gilolo, through the island of Bouru, and curving round the west end of Flores, then bending back by Sandalwood island to take in Rotti, divides the two races, and this line corresponds pretty generally with the zoological line, if we make allowance for the greater expansive and permeable power of the Malay race. If two gases are separated by a porous membrane, it is found that they vary in their degrees of permeability; one invades the territory of the other with greater force and in less time than is required for the converse action: and so it is with races; this is expansive and aggressive, that is passive and contracts. Celebes, whose animals approximate rather to the Eastern type, is inhabited by races of Western origin; Bouru, which derives its fauna from New Guinea, is a meeting-place for the two races of men; the Malays of Java have spread along the southern chain, further than its beasts and birds, into the region of the cockatoo and the mound-turkey; and finally the inhabitants of Chandana and Rotti, lying far to the east of the Malay countries, seem connected, perhaps by admixture, with a still more western race, the Hindus—a peculiar circumstance which bears witness to the former wandering habits of a nation now the most sedentary on the face of the earth.*

*Words and institutions of course travel faster than races; but the Hindu religion and language could not have fixed themselves so firmly in Java and Bali without a large admixture of genuine Hindus with the original population. In Bali the four castes, and the era of Saliváhaua, have maintained themselves to the present day: and in Java the staple of popular literature consists of tales from the Mahábhárata and the Rámáyana. The Sanscrit root *tap*, in its meaning of religious observance, has spread over the whole of the South Sea islands as *tabu*; just as the Buddhist Sramana is found as a *Shaman* on the shores of the Polar Sea.

The Malays proper are traced by popular tradition to Meningkabao, a tract of country in the centre of Sumatra, from whence they emigrated to Singapore, and thus spread over the neighbouring regions. But this description can only apply to the ruling family in the great Malayan race, which forms, with a few slight exceptions, the entire population of the great islands of Borneo, Java, Sumatra and Celebes, of the Malay peninsula, the Philippine group, and the lesser islands scattered among these. The physical characteristics of all these races are the same—the light olive brown colour, the black, straight, and coarse hair, the absence of beard and whisker (a Javanese with three straggling hairs upon his chin prides himself upon his beard, and cultivates it with care), the short stature, the eyes slightly oblique, the flat face, the straight and well-shaped nose, the prominent cheek-bones; and their languages, although presenting an admixture of several types, have much even of the radical part in common. One or two examples taken from the commoner words in the vocabularies of Messrs. Wallace and Crawfurd will illustrate this. Rice husked is *bras* in Malay and Javanese, *berasa* or *werasa* in the dialects of Celebes, *bias* among the Dyaks, *bira* as far east as the Sula islands and Tidore, and *bayas* among the mountaineers of Quedah in the peninsula; rice in the husk is called by the well-known Malayan word *padi* in all these countries except in Celebes, where a different root, *asi*, comes into use; a child is *anak* in Malay, Javanese, Madura, Sunda, the language of the Biajuk Dyaks, the languages of Celebes, the Sanguir islands approaching the Philippines, the Rotti islands south-west of Timor, and even the distant Madagascar, which has preserved many traces of Malay colonization; the words for sky, sun, moon, stone, wood, white, blue, and other such elementary ideas are as widely diffused. Turning to the numerals, we find that five is *lima* or *rima* in thirty out of thirty-three languages tabulated by Mr. Wallace, and the same general similarity prevails, with some curious exceptions, in all the languages.

Mr. Crawfurd holds * some very peculiar views with regard to the origin of the common words in these languages—views which run counter to the generally received belief as to the genesis of dialectical changes. He supposes each dialect to have been originally distinct, and to have approximated to the rest by the adoption

* Or rather held in 1820. We are unaware how far the views of this veteran ethnologist may have been modified before his death in 1868.

of words from the great Polynesian language, which was spoken by no special race, but spread in an undefined manner from Madagascar to the furthest islands of the South Sea. But in the first place, there is no such thing as a general language which is not spoken, and has never been spoken, by a particular people, but from which particular races may draw at pleasure; and in the second place, multiplicity is not the primary fact in language, but the ultimate fact; dialects do not approximate, but diverge. If there ever was a great Polynesian language, it is the foundation of all these languages, not a common addition to each. But the vocabularies before us lead to no distinct conclusion as to the existence of such a language; they rather confirm Mr. Wallace's view of the essential distinctness of the Polynesian and Malayan races. Taking the words which come first in Mr. Crawford's "specimen of the Great Polynesian language," *tanah*, land or earth, is simply a Malay word, which does not occur in the Polynesian portion of the Archipelago, and which is common to all the purely Malay countries, except where supplanted by the Sanscrit *bhumi*, *langit*, sky, is even more distinctly Malay; *bulan*, moon, spreads beyond the Malay countries, but only into those borderlands of Amboyna and Ceram which are specially exposed to Malay influence; in Mysol, New Guinea, and even Gilolo quite new roots occur. *Watu*, stone, is Malayan, and has spread to Timor; *wah*, water, is really Polynesian, as it does not occur in Malay and Javanese, and only in one of the Celebes dialects; and so on. Thus analysis separates distinctly the Malay from the Polynesian roots. Apparently, the Papuan roots are of a third type, though we have here less material to go upon. Mr. Crawford gives as a specimen the language of the Samang, or woolly-haired race in the Malayan peninsula, who are not Papuans but Negritos. Mr. Wallace lent his Papuan vocabularies to Mr. Crawford, who mislaid them; and has only preserved that of an isolated race in the interior of Mysol, which seems to contain a large proportion of peculiar roots, though the numerals are borrowed from Javanese, and the names of introduced animals, such as the deer and pig, resemble those in use in Ceram and other Polynesian islands.

Considering that the Kawi, or sacred language of Java, is of distinctly Sanscrit origin, it is surprising how few Hindu words are to be met with in the Jawi, or common Javanese of the present day. In the hundred and seventeen specimen words given by Mr. Wallace, we find only six that appear to be of

Hindu origin, namely *guni*, fire, from *agni*; *madu*, honey; *untu*, tooth; *sagoro*, sea; *undok*, egg; and *mas*, gold, which is probably derived from the *masha* or goldsmith's weight. To these may be added *mega*, a cloud; *bapa*, father (which belongs, however, to an almost universal class of words, and is rather formed from a child's first utterances than from any root with a meaning); *singa*, lion; *morac*, peacock; *tambuca*, copper; *mutyara*, pearl; *kupas*, cotton; *sutra*, silk; *jarac*, castor-oil plant; *nila*, indigo; *maricha*, pepper; *nyu* (perhaps), cocoa-nut; *pala* (from *phala*), nutmeg (*the fruit par excellence*); *nanas*, pine-apple; *jantra*, spinning-wheel; *danda*, fine or penalty; *raja*, king; *desa* country; *nagara*, city; *agama*, religion (evidently from the Sanscrit *āgama*, which has rather the meaning of a code of religious laws); *tapa*, penitence; *swarga*, heaven; *naraka*, hell; *guru*, a teacher. Most of these are such words as a nation naturally borrows from one more civilized,—religious terms, and the names of introduced articles and luxuries: and their introduction is easily enough accounted for. A few more words, which have not survived in Java, are traceable in other parts of the Archipelago, as the Malay *kapala*, head; *rupa*, face, and *basi*, rain, in the Salayer dialect of Celebes, and *manesh*, a man, which occurs in the language of the Sanguir islands, between Celebes and the Philippines. On the whole, the Malay languages, except the Javanese, are, considering the maritime position of the small and scattered race, and the extent to which they have been brought in contact with foreigners in all ages, remarkably free from extraneous admixture. Before the dawn of history, the Malays formed a marked nationality, with a character of their own, and, in spite of the religious revolution which has attached them, though loosely, to Islam, they have preserved it to this day.

Mr. Wallace considers the Malays deficient in intellect; and in fact they have originated little; but the builders of Boro Budor and Brambanam, and the compilers of the elaborate Malayan nautical code, are not to be ranked with savages. True, they have not, like the Hindus and Teutons, worked out a civilization for themselves, and therefore they exist now in very different grades of social development, from the untaught hill-Dyaks of inner Borneo, who have learnt nothing from Telinga, Arab, or Christian, to the Javanese princes, with their ornate houses and elaborate mode of life. Cannibalism is said to exist, or to have lately existed, among the Battas of Sumatra: but cannibalism by no

means connotes an extremely low grade of civilization; the Feejeeans are among the more intelligent of the islanders, and the Maoris undoubtedly the noblest race in the South Seas; while the Fans of M. du Chaillu are, if we remember right, an advanced people. The habit of eating man's flesh is, in fact, not a characteristic of the species in its lowest aspect, out of which we have all grown, but an abnormal custom, begotten in every case by peculiar circumstances, and one which, unless factitiously adopted, as it seems to be by some of the rebel Maoris, as a principle of union against the stranger, at once dies out when those who have adopted it become amenable to the influences and instincts of the race at large. Among the Malays, who, if not originative, are a peculiarly impressible people, it cannot possibly survive the isolation of a community. Piracy is perhaps a more inveterate evil; but even that is found to give way before strong measures, and what goes even further with Malays, a good example. If the English had held the place of the Portuguese, or even of the Dutch, in these seas, its extinction would have been rapid. But characters such as those of Raffles and Brooke, are rarely to be met with in the history of the Dutch and Portuguese Governments in the East.

The Malays are undemonstrative and diffident in character, taciturn and polite, but seldom merry; and they present a curious contrast to the Papuan branch of the islanders, who have all the animation and liveliness, all the sympathetic character which belongs to Negroes. There are four great tribes of civilized Malays, the Malays proper, the Javanese, the Bugis, and the Tagalas of the Philippine islands: of these the three first tribes are all Muhammadan, excepting the inhabitants of Bali and Lombok who adhere to Hinduism, mostly of a Pauranic type, and among whom subsist a few Buddhists. The islanders of Luçon are nearly all Catholics, but Muhammadanism still prevails among the Moros of the Southern Philippines. Thus, as a race, we may say that the Malays have joined the religion of Muhammad in a body, though it sits more lightly upon them than upon any of the faith, excepting the Bedouin Arabs, who are not much given to religion in any form. Many of the Javanese have never heard the name of their Prophet, and few indeed keep his precepts. A Wahhabi casuist informed Palgrave that there were two sins only on which God had no mercy,—idolatry or the adoration of the creature, and "drinking the shameful," by which he meant the use of tobacco. Yet the seven-headed Nága, the deity of his

ancestors, is still carried before a Javanese Raja even on the solemn festivals prescribed in the Koran, and the use of narcotics is probably more extensive and unbridled among the Malays than in any other nation.

The Dyaks are distinctly a branch of the Malay type, but differ from the Malays generally on many points of physiognomy and character. Mr. Wallace was much struck with their simplicity and honesty, with their capacity for being amused, and their high moral tone, which, to those who have only heard of them as head-hunters and pirates, is sufficiently surprising. With temperate habits, abundance of food, a healthy climate, and early marriages, they are still stationary, if not retrograde, in point of population, and dwell in scattered villages among the uncleared forest. Mr. Wallace explains this curious anomaly in a way which seems to us satisfactory. He says that "the average number of children in a Dyak family is not more than three or four; and if in a family of three or four, one or two die before reaching maturity, it is plain that the parents only just replace themselves. The question is thus narrowed to the cause of these small families; and that is obviously a condition which the Dyaks share in common with all savage tribes, the hard labour imposed upon the women. A Dyak woman generally spends the whole day in the field, and carries home every night a heavy load of vegetables and firewood, often for several miles, over rough and hilly paths. Besides this, she has an hour's work every evening to pound the rice with a heavy wooden stamper,"—the familiar *dhenki* of India, "which violently strains every part of the body. She begins this kind of labour when nine or ten years old, and it never ceases but with the extreme decrepitude of age. Surely we need not wonder at the limited number of her progeny, but rather be surprised at the successful efforts of nature to prevent the extermination of the race."

From one extremity to the other of the Malay region, that is to say, in the mountains of Mindanao, in those of the peninsula of Malacca, and in the Andaman islands, are scattered relics of a race which must once have been more numerous. Black and woolly-haired, like the Papuans and the Negroes, they differ more or less from both. The Papuan has a narrow, prominent, and arched nose; the Negrito nose is flat and often snub. The lips are not thick, and the stature is smaller than that of the African races. Their manners are wild in the extreme, resembling those of the

Veddahs of Ceylon.* "They are said," observes Bowring, "to wear no garments, to build no houses, to dress no food. They wander in the forest, whose wild fruits they gather by day, and sleep among the branches of the trees by night. They have no form of government, no chief, no religious rites or usages." He thinks they resemble the Madagascar people more than any other, and this brings us back to the belief we have more than once referred to, that in long distant days a continent bridged over the Southern Ocean from Madagascar to the Indian Isles. The strange connection between the fauna of Celebes and that of Africa is thus accounted for, and the presence in the Archipelago of the singular group of *Lemuridae*, whose principal home is in Madagascar. If *Quadrumana* found their way between points so distant, why not man? and small colonies of the human race, cut off from their fellows by an impassable ocean, and driven by the spread of an alien and intellectually higher family into mountains and untraversable thickets, would naturally degenerate, or, we should rather say, would retain their animal habits of life, and develop a purely animal organization. To this race, the name of Negrito, originally given by the Spanish inhabitants of the Philippines, has been extended in the language of science.

The Papuans present a third type, and one almost peculiar to New Guinea and the adjacent islands. Their colour is a deep sooty brown approaching to black. The hair is "harsh, dry, and frizzly, growing in little tufts or curls, which in youth are very short and compact, but afterwards grow out to a considerable length, forming the compact frizzled crop which is the Papuan's pride and glory." The face is adorned with a frizzled beard. The stature is equal to that of a European; the nose is large, arched, and high (a feature repeated in their household gods), and the lips thick. The Papuan is impulsive and demonstrative, laughs, yells, and leaps. He has no shyness, and even the women and children do not avoid a white face. He has a feeling for art, and decorates his house and canoe with elaborate carving. The Papuans are deficient in the affections

* See all the accounts of the Andaman Islands, especially Dr. Mouat's. Professor Owen was struck with the admirable development of the Andamanese whom he examined; indeed, as far as muscular strength goes, this variety of the human race, considered as an animal, ranks very high. Natural selection has advanced with them in an exclusively physical direction, and for tribes living in dense jungle and climbing trees a small stature is a distinct advantage. For the Negritos, see Sir John Bowring's *Visit to the Philippine Islands*, pp. 166, 167.

and moral sentiments, even compared with the Malays; and though individually they are often rapid learners, their tribes seem incapable of making a permanent advance, owing perhaps to the very impressibility of their shallow minds, which take the form of the moment, and admit no lasting impression; in this feature they agree with many African races. The typical Papuans are confined to New Guinea, (of which only the inhabitants of the coast, who build their villages on stages in the water, like the ancient lake-villages of Switzerland, are well known to us), and the islands of Kè and Aru, with Mysol and Waigiou. In some of these haunts, especially in Aru, they were well studied by Mr. Wallace. The Timorese are essentially Papuan, and remarkably fine, handsome men.

There is yet a fourth variety of man in the islands—a brown Polynesian type, similar to the Papuan in height, features, and character, but of lighter colour, and with less frizzled hair. This race, which occupies nearly all the islands in the Pacific, occurs within our region in Gilolo, where it is confined to the Northern peninsula, Ceram, and the adjacent islands. They are called Alfuros, and appear as indigenous on these islands, but are continually pressed upon by the Malay races, and in many cases seem to have coalesced with them, and formed cross-breeds. The race, however, is radically distinct, and can be traced from island to island into the pure Polynesian countries.

Mr. Wallace is fond of the Papuans, and sympathises generally with man in the rough, but though the brisk, lively Papuan is in himself a more interesting object than the sedate Malay, it is not difficult to see that the latter possesses a distinguishing mark of the greatest value—the *capacity for improvement*. True, Malay civilization runs almost through the whole human gamut, from the man-eating Battas to the Raja of Johore; and true also, that individual Papuans, like individual Africans, may prove teachable enough; but we must judge of race, not by the achievements of selected specimens, nor by the degradation of its lowest elements, but by its collective force and action. Civilization does not embrace more than the upper half of the most highly developed nation: not in Aru or Sumatra are its essentials more wanting than in Seven Dials: the first question to put is, does the nation, as a whole, learn and grow? Tried by this test, we shall find the Malays to be both recipient and aggressive, and therefore likely to hold their own in the struggle for life, while the Papuans belong to a race, which, however sad it may seem, must in the nature of things recede before civilization and

progress, and finally, like the Caribs and Tasmanians, fade from the surface of the earth, and live only in tradition with the dodo and the moa. There has been a time when civilization and Christianity seemed to sanction the ruthless extermination of aboriginal races ; philanthropy, as a ruling conception, is purely modern, and marks more than anything else the world's advance in morality ; but the weaker must sink before the stronger by inevitable law, and philanthropy can only smooth the dying pillow for races which nature has inexorably condemned.
